

**EMBEDDING AND ENCAPSULATION OF SENSITIVE
COMPONENTS INTO A MATRIX TO OBTAIN DISCRETE
CONTROLLED RELEASE PARTICLES**

ABSTRACT OF THE DISCLOSURE

5 Controlled release, discrete, solid particles which contain an encapsulated and/or embedded component such as a heat sensitive or readily oxidizable pharmaceutically, biologically, or nutritionally active component are continuously produced without substantial destruction of the matrix material or encapsulant. A release-rate controlling component is incorporated into the

10 matrix to control the rate of release of the encapsulant from the particles. The additional component may be a hydrophobic component or a high water binding capacity component for extending the release time. The plasticizable matrix material, such as starch, is admixed with at least one plasticizer, such as water, and at least one release-rate controlling component under low shear mixing conditions to plasticize the plasticizable material without substantially destroying the at least one plasticizable material and to obtain a substantially homogeneous plasticized mass. The plasticizer content is substantially reduced and the temperature of the plasticized mass are substantially reduced prior to admixing the plasticized mass with the encapsulant to avoid substantial destruction of the

15 encapsulant and to obtain a formable, extrudable mixture. The mixture is extruded through a die without substantial or essentially no expansion and cut into discrete, relatively dense particles. Release properties may also be controlled by precoating the encapsulant and/or coating the extrudate particles with a film-forming component.

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